



Software Construction & Development

“Lab 05”

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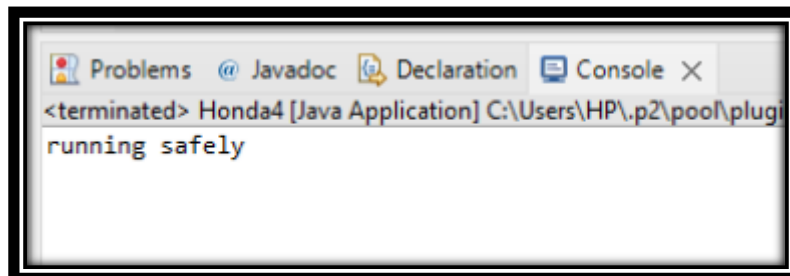
Roll no : 2021-BSE-032

Section : V-A

1. Java Example :

```
1 package lab5;
2 abstract class Bike{
3     abstract void run();
4 }
5 class Honda4 extends Bike{
6     void run()
7     {
8         System.out.println("running safely");
9     }
10 public static void main(String args[])
11 {
12     Bike obj = new Honda4();
13     obj.run();
14 }
15 }
```

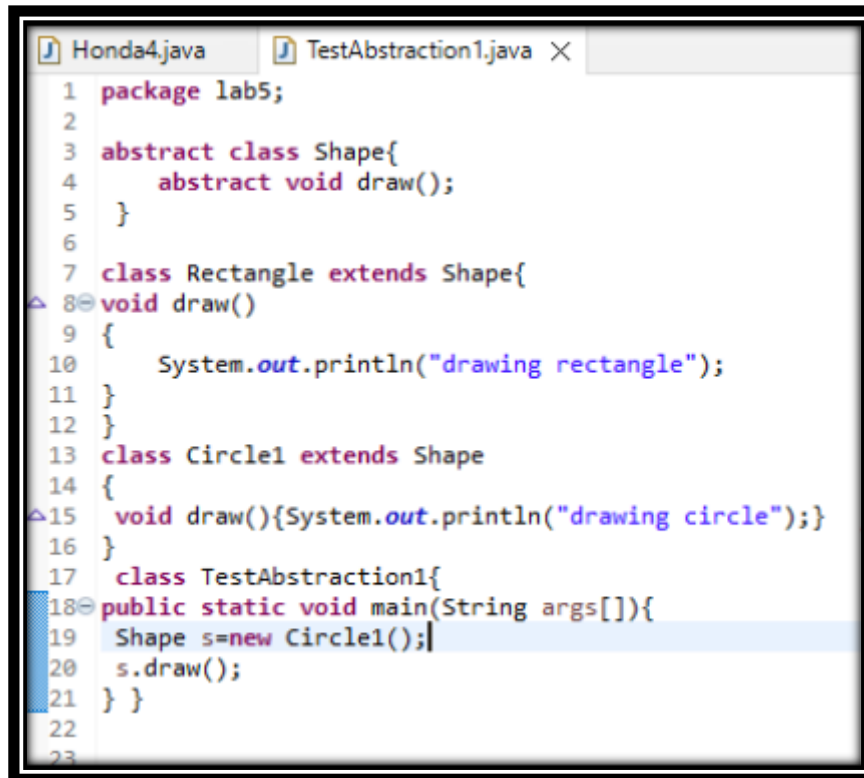
OUTPUT:



The screenshot shows the IDE's console window with the following content:

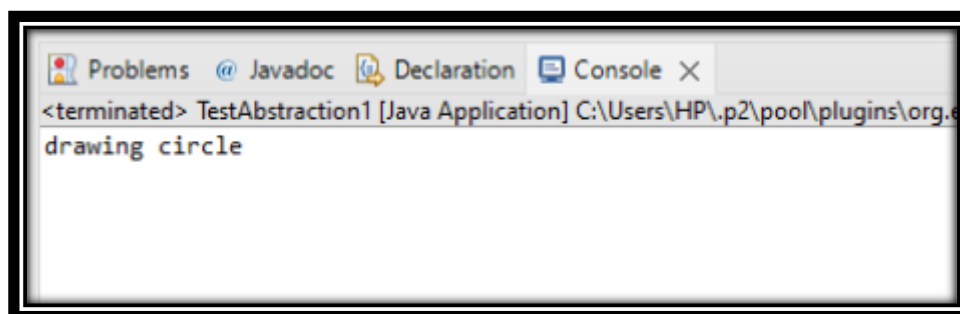
```
<terminated> Honda4 [Java Application] C:\Users\HP\.p2\pool\plugi
running safely
```

2. Java Example:



```
1 package lab5;
2
3 abstract class Shape{
4     abstract void draw();
5 }
6
7 class Rectangle extends Shape{
8     void draw()
9     {
10         System.out.println("drawing rectangle");
11     }
12 }
13 class Circle1 extends Shape
14 {
15     void draw(){System.out.println("drawing circle");}
16 }
17 class TestAbstraction1{
18     public static void main(String args[]){
19         Shape s=new Circle1();
20         s.draw();
21     } }
22
23
```

OUTPUT:



```
<terminated> TestAbstraction1 [Java Application] C:\Users\HP\p2\pool\plugins\org.e
drawing circle
```

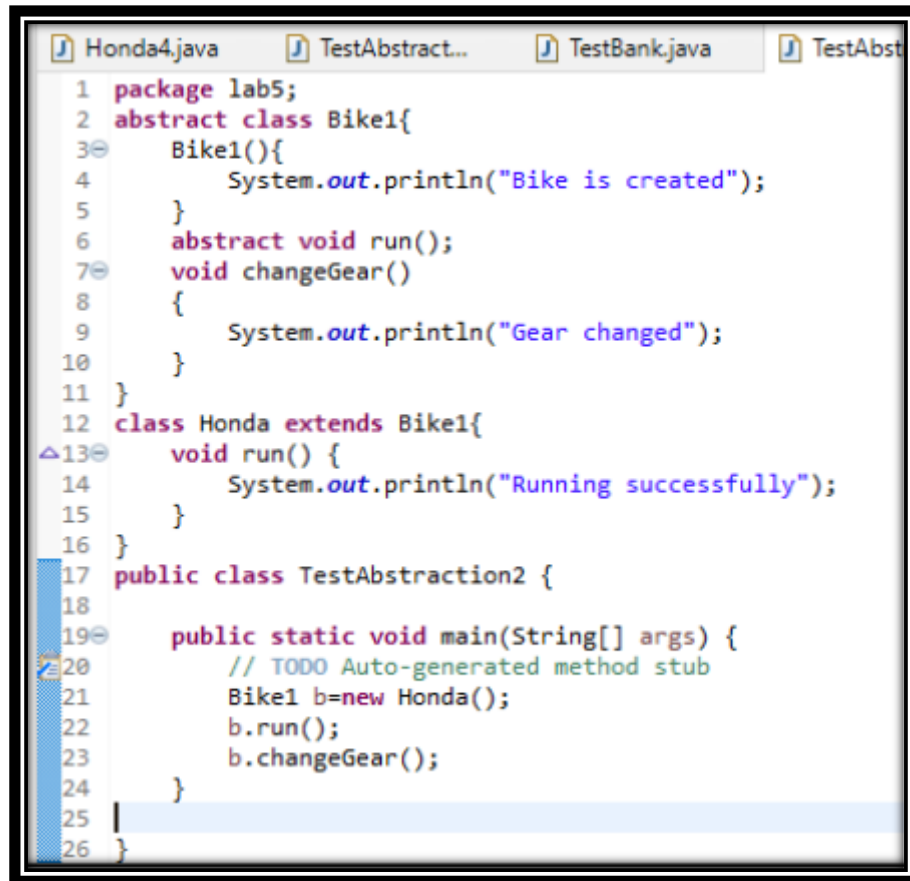
3. Java Example :

```
Honda4.java  TestAbstraction1.java  TestBank.java X
1 package lab5;
2 abstract class Bank{
3     abstract int getRateofInterest();
4 }
5 class SBI extends Bank{
6     int getRateofInterest()
7     {
8         return 7;
9     }
10 }
11 class PNB extends Bank{
12     int getRateofInterest()
13     {
14         return 8;
15     }
16 }
17 public class TestBank {
18
19     public static void main(String[] args) {
20         // TODO Auto-generated method stub
21         Bank b1=new SBI();
22         Bank b2=new PNB();
23         System.out.println("Rate of interest of SBI = "+b1.getRateofInterest());
24         System.out.println("Rate of interest of PNB = "+b2.getRateofInterest());
25     }
26
27 }
28
```

OUTPUT:

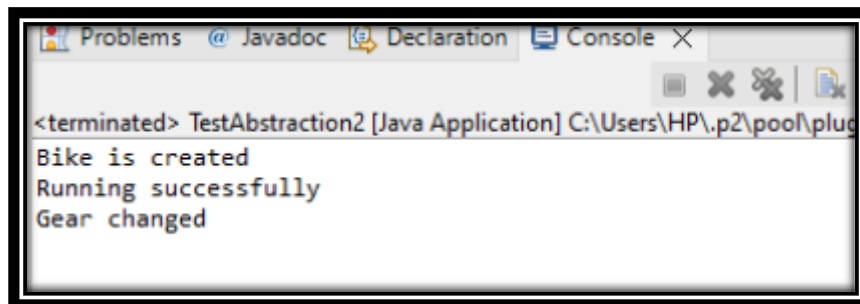
```
Problems  @ Javadoc  Declaration  Console X
<terminated> TestBank [Java Application] C:\Users\HP\.p2\pool\plug
Rate of interest of SBI = 7
Rate of interest of PNB = 8
```

4. Java Example :



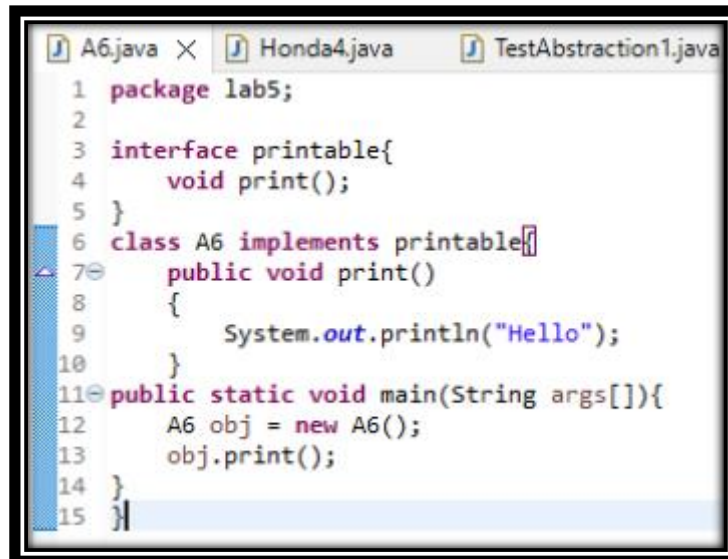
```
1 package lab5;
2 abstract class Bike1{
3     Bike1(){
4         System.out.println("Bike is created");
5     }
6     abstract void run();
7     void changeGear()
8     {
9         System.out.println("Gear changed");
10    }
11 }
12 class Honda extends Bike1{
13     void run() {
14         System.out.println("Running successfully");
15     }
16 }
17 public class TestAbstraction2 {
18
19     public static void main(String[] args) {
20         // TODO Auto-generated method stub
21         Bike1 b=new Honda();
22         b.run();
23         b.changeGear();
24     }
25
26 }
```

OUTPUT:



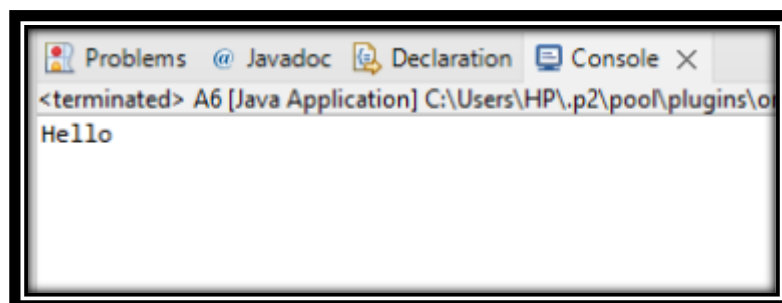
```
<terminated> TestAbstraction2 [Java Application] C:\Users\HP\p2\pool\plug
Bike is created
Running successfully
Gear changed
```

5. Java Interface Example :



```
1 package lab5;
2
3 interface printable{
4     void print();
5 }
6 class A6 implements printable{
7     public void print()
8     {
9         System.out.println("Hello");
10    }
11 public static void main(String args[]){
12     A6 obj = new A6();
13     obj.print();
14 }
15 }
```

OUTPUT:



```
<terminated> A6 [Java Application] C:\Users\HP\.p2\pool\plugins\or
Hello
```

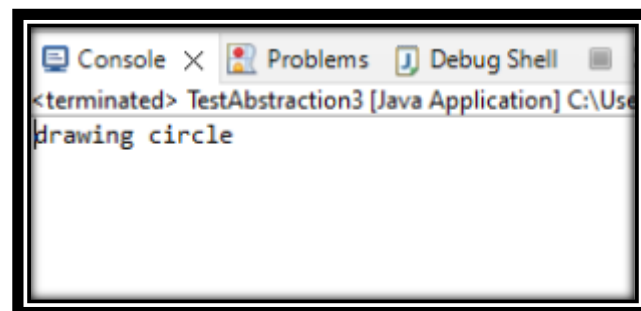
6. Java Interface Example :

```

1 package lab5;
2
3 interface Drawable{
4 void draw();
5 }
6
7 class Rectangle1 implements Drawable{
8 public void draw()
9 {
10     System.out.println("drawing rectangle");
11 }
12 }
13 class Circle2 implements Drawable{
14 public void draw()
15 {
16     System.out.println("drawing circle");
17 }
18 }
19 class TestAbstraction3{
20 public static void main(String args[]){
21     Drawable d=new Circle2();
22     d.draw();
23 }}

```

OUTPUT:



The screenshot shows a Java IDE window with three tabs: 'Console', 'Problems', and 'Debug Shell'. The 'Console' tab is active, displaying the output of the program. The text in the console is: '<terminated> TestAbstraction3 [Java Application] C:\Use' followed by a new line and 'drawing circle'.

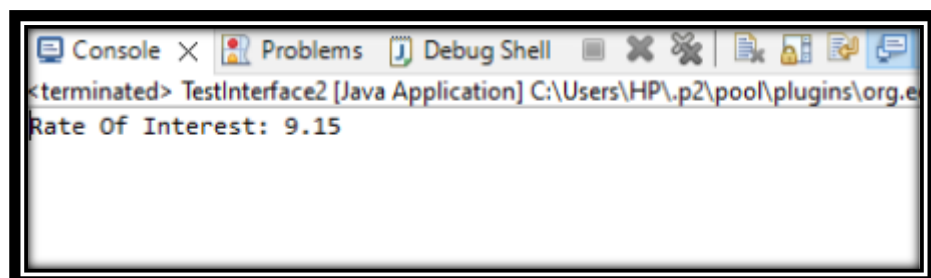
7. Java Interface Example :

```

1 package lab5;
2
3 interface Bank1{
4     float rateOfInterest();
5 }
6
7 class SBI1 implements Bank1{
8     public float rateOfInterest()
9     {return 9.15f;}
10 }
11 class PNB1 implements Bank1{
12     public float rateOfInterest()
13     {return 9.7f;} }
14 class TestInterface2{
15     public static void main(String[] args){
16         Bank1 b=new SBI1();
17         System.out.println("Rate Of Interest: "+b.rateOfInterest());
18     }}

```

OUTPUT:



The screenshot shows an IDE window with tabs for 'Console', 'Problems', and 'Debug Shell'. The 'Console' tab is active, displaying the output of the Java application. The text in the console is:

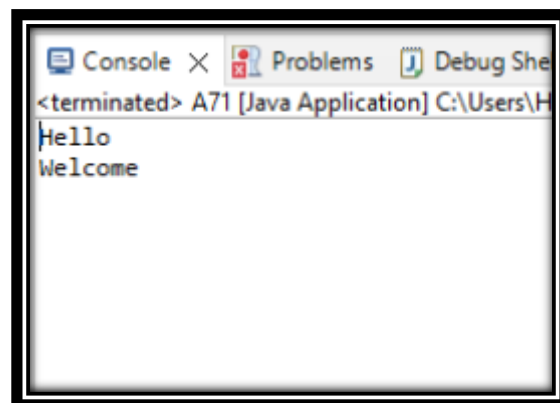
<terminated> TestInterface2 [Java Application] C:\Users\HP\.p2\pool\plugins\org.e

Rate Of Interest: 9.15

8. Java Interface Example :


```
1 package lab5;
2 interface Printable1{
3     void print();
4 }
5 interface Showable2{
6     void show();
7 }
8 class A71 implements Printable1, Showable2{
9     public void print()
10    {System.out.println("Hello");}
11    public void show()
12    {System.out.println("Welcome");}
13 }
14
15 public static void main(String args[]){
16     A71 obj = new A71();
17     obj.print();
18     obj.show();
19 }
20 }
```

OUTPUT:



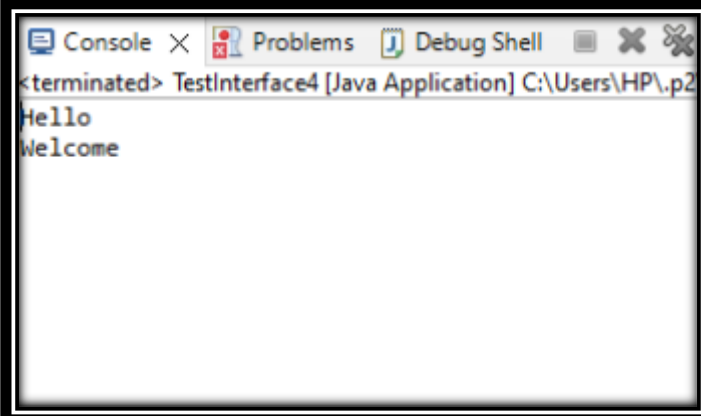
The screenshot shows a Java IDE window with a console tab. The console output displays the text "Hello" followed by "Welcome" on the next line. The window title bar includes "Console", "Problems", and "Debug Shell". The main title of the window is "<terminated> A71 [Java Application] C:\Users\H".

```
<terminated> A71 [Java Application] C:\Users\H
Hello
Welcome
```

9. Interface Inheritance Example :

```
1 package lab5;
2
3 interface Printable2{
4     void print();
5 }
6 interface Showable3 extends Printable2{
7     void show();
8 }
9 class TestInterface4 implements Showable3{
10     public void print()
11     {
12         System.out.println("Hello");
13     }
14     public void show()
15     {
16         System.out.println("Welcome");
17     }
18
19     public static void main(String args[]){
20         TestInterface4 obj = new TestInterface4();
21         obj.print();
22         obj.show();
23     }
24 }
```

OUTPUT:



The screenshot shows a Java IDE window with a console tab. The console output displays the results of the program execution: "Hello" followed by "Welcome" on the next line. The window title bar includes "Console", "Problems", and "Debug Shell". The console text area shows the output of the program, which is "Hello" and "Welcome".

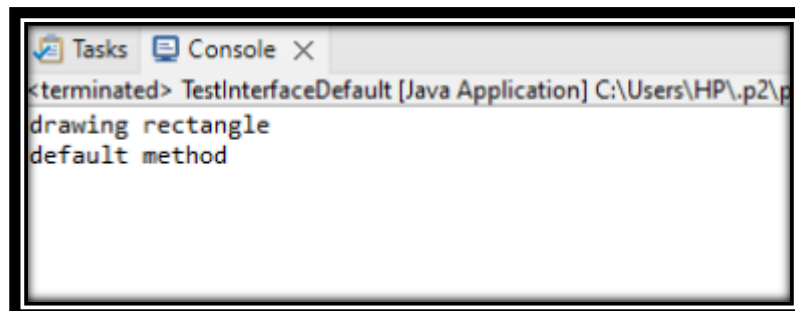
10. Default Method Example:

```

1 package lab5;
2
3 interface Drawable2{
4 void draw();
5 default void msg()
6 {
7     System.out.println("default method");
8 }
9 class Rectangle3 implements Drawable2{
10 public void draw(){System.out.println("drawing rectangle");}
11 }
12 class TestInterfaceDefault{
13 public static void main(String args[]){
14     Drawable2 d=new Rectangle3();
15     d.draw();
16     d.msg();
17 }}

```

OUTPUT:



The screenshot shows a Java IDE console window with the following output:

```

<terminated> TestInterfaceDefault [Java Application] C:\Users\HP\.p2\p
drawing rectangle
default method

```

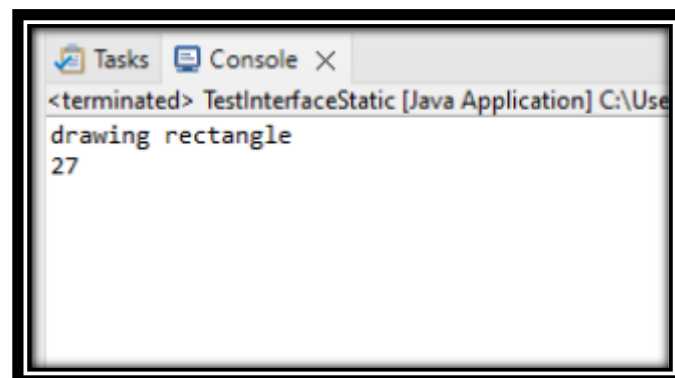
11. Static Method In Interface Example:

```

1 package lab5;
2 interface Drawable4{
3     void draw();
4     static int cube(int x)
5     {
6         return x*x*x;
7     }
8 }
9
10 class Rectangle4 implements Drawable4{
11     public void draw()
12     {
13         System.out.println("drawing rectangle");
14     }
15 }
16 class TestInterfaceStatic{
17     public static void main(String args[]){
18         Drawable4 d=new Rectangle4();
19         d.draw();
20         System.out.println(Drawable4.cube(3));
21     }
22 }

```

OUTPUT:



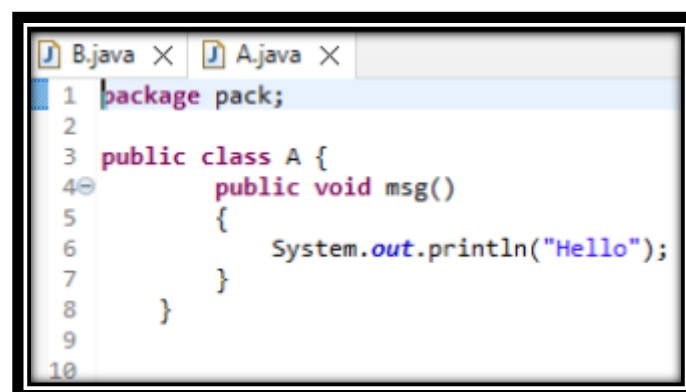
The screenshot shows a Java IDE window with a tab labeled 'Console'. The output text is as follows:

```

<terminated> TestInterfaceStatic [Java Application] C:\Use
drawing rectangle
27

```

12. Java Package Example :

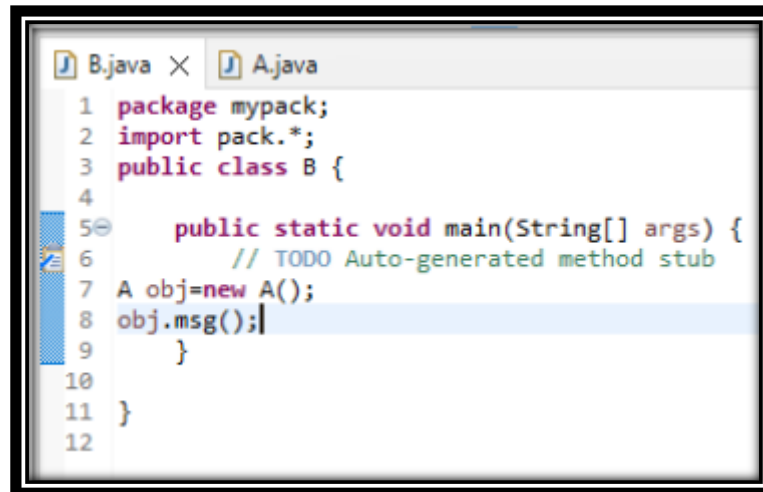


The screenshot shows a Java IDE window with two tabs: 'B.java' and 'A.java'. The code in 'A.java' is as follows:

```

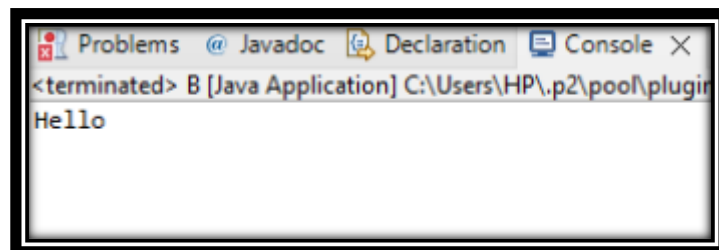
1 package pack;
2
3 public class A {
4     public void msg()
5     {
6         System.out.println("Hello");
7     }
8 }
9
10

```



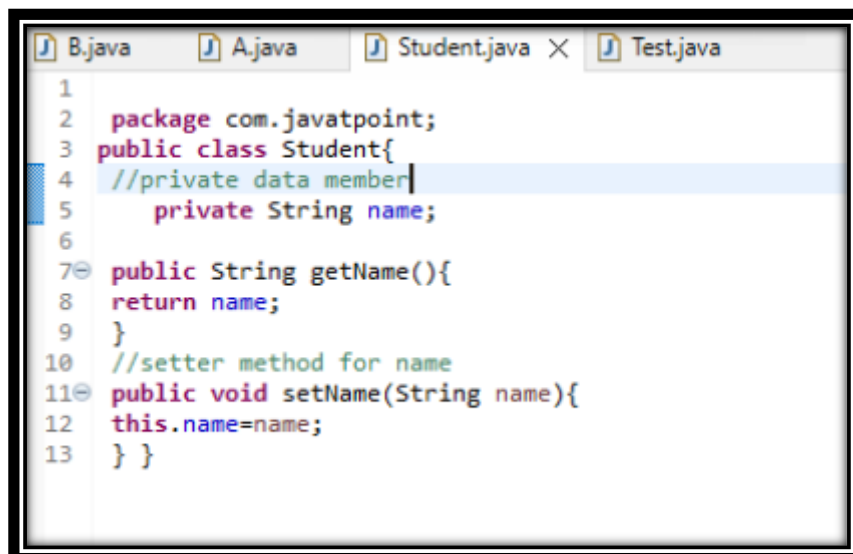
```
1 package mypack;
2 import pack.*;
3 public class B {
4
5     public static void main(String[] args) {
6         // TODO Auto-generated method stub
7         A obj=new A();
8         obj.msg();
9     }
10
11 }
12
```

OUTPUT:

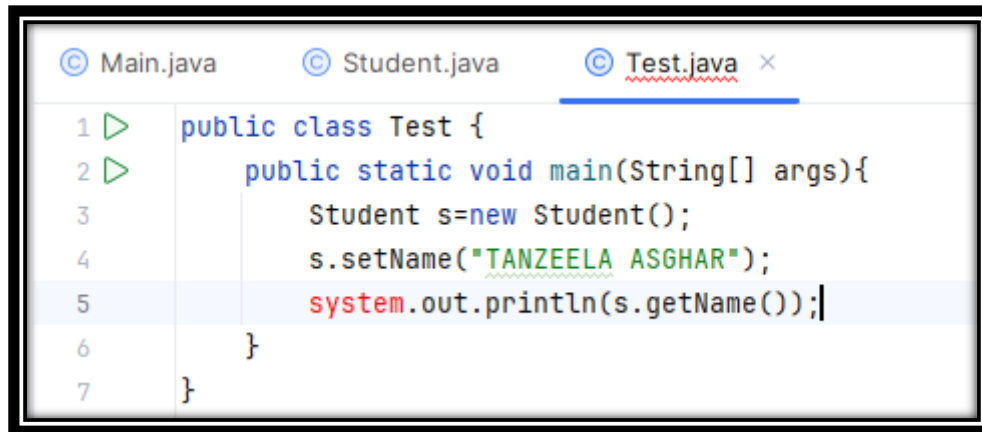


```
<terminated> B [Java Application] C:\Users\HP\p2\pool\plugin
Hello
```

13. Encapsulation Example:



```
1
2 package com.javatpoint;
3 public class Student{
4     //private data member
5     private String name;
6
7     public String getName(){
8         return name;
9     }
10    //setter method for name
11    public void setName(String name){
12        this.name=name;
13    } }
```



```
© Main.java © Student.java © Test.java x
1  public class Test {
2      public static void main(String[] args){
3          Student s=new Student();
4          s.setName("TANZEELA ASGHAR");
5          system.out.println(s.getName());
6      }
7  }
```

OUTPUT:



```
Run Test x
:
C:\Users\92313\.jdk\openjdk-21\bin\java.exe "-jav
.jar=50381:C:\Program Files\JetBrains\IntelliJ ID
.encoding=UTF-8 -classpath C:\Users\92313\Desktop
TANZEELA ASGHAR
Process finished with exit code 0
>
```

14. Encapsulation Example :

```
B.java A.java Student.java Test.java Account.java X
1 package lab_5p;
2 class Account{
3     private long acc_no;
4     private String name,email;
5     private float amount;
6     public long getAcc_no() {
7         return acc_no;
8     }
9     public void setAcc_no(long acc_no) {
10        this.acc_no = acc_no;
11    }
12    public String getName() {
13        return name;
14    }
15    public void setName(String name) {
16        this.name = name;
17    }
18    public String getEmail() {
19        return email;
20    }
21    public void setEmail(String email) {
22        this.email = email;
23    }
24    public float getAmount()
25    {
26        return amount;
27    }
28    public void setAmount(float amount) {
29        this.amount = amount;
30    }
31 }
```

```
B.java X A.java Student.java Test.java Account.java TestAccount.java X
1 package lab_5p;
2 public class TestAccount {
3     public static void main(String[] args) {
4         Account acc=new Account();
5         acc.setAcc_no(061);
6         acc.setName("SABAH TARIQ");
7         acc.setEmail("sabatarig050.com");
8         acc.setAmount(250000);
9         //getting values through getter methods
10        System.out.println("Account no. = "+acc.getAcc_no()+" \nName = "+acc.getName()+" \nEmail = "+
11        acc.getEmail()+" \nAmount = "+acc.getAmount());
12    }
13 }
```

OUTPUT:

```
Run Test X
.jar=50401:C:\Program Files\JetBrains\IntelliJ IDEA Commu
.encoding=UTF-8 -classpath C:\Users\92313\Desktop\lab_05\
ACCOUNT NO. = 32
NAME=TANZEELA ASGHAR
EMAIL = tanzeelaasghar@gmail.com
AMOUNT=30,000.0
```